Australian Standard®

Steel conductors and stays—Bare overhead

Part 1: Galvanized (SC/GZ)

This Australian Standard was prepared by Committee EL/10, Overhead Lines. It was approved on behalf of the Council of Standards Australia on 21 July 1992 and published on 12 October 1992.

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Australian Electrical and Electronic Manufacturers Association

Australian Porcelain Insulators Association

Confederation of Australian Industry

Electricity Supply Association of Australia

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PREFACE

This Standard was prepared by the Standards Australia Committee on Overhead Lines to supersede AS 1222.1—1973, *Steel conductors and stays for overhead power transmission purposes,* Part 1: *Galvanized (SC/GZ)*. It is the first in a two-part series, viz.

AS 1222—*Steel conductors and stays—Bare overhead*

Part 1: *Galvanized (SC/GZ)*

Part 2: *Aluminium clad (SC/AC)*

This Standard conforms generally with IEC 888, *Zinc-coated steel wires for stranded conductors.*

The Standard does not cover galvanized steel wire for use in ropes or strands; these are dealt with, respectively, by AS 1394, *Round steel wire for ropes,* and AS 2841, *Galvanized steel wire strand*

To determine conductor sizes, a range of wire sizes has been provided similar to that for conductors specified in the 1973 edition. However, conductors with other dimensions can also be determined by reference to this Standard.

Wire sizes have not been changed from the previous edition but major modifications have been made in the following areas:

(a) The resistivity of wire has been modified to reflect a more realistic value.

(b) The sampling rate of specimens for routine tests relies on a quality assurance plan

(c) The percentage elongation test has been replaced by a mandatory torsion test.

(d) The overall frequency of testing has been increased, especially for the wrapping test, from 10% to 100% on the selected specimens.

(e) A new Appendix B covers the coefficient of linear expansion and the theoretical basis for the calculation of modulus of elasticity.

(f) A new Appendix C has been included which highlights items that should be specified by the purchaser or agreed between purchaser and manufacturer at the time of order.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies requirements and tests for bare electrical conductors and stays for overhead power transmission purposes, constructed from galvanized steel wires.

For the purpose of this Standard, the term 'conductor' includes 'stays'.

NOTES:

1 Appendix A gives methods to calculate conductor properties.

2 Appendix B gives the coefficient of linear expansion and the theoretical basis for the calculation of modulus of elasticity.

3 Appendix C lists information which should be supplied with enquiries and orders for conductors.

1.2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
1057 Quality assurance and quality control—Glossary of terms

1391 Methods of tensile testing of metals

1442 Carbon steels and carbon-manganese steels—Hot-rolled bars and semi-finished products

1650 Hot-dipped galvanized coatings on ferrous articles

2505 Methods for bend and related testing of metals
2505.5 Part 5: Torsion and wrapping tests on wire

2857 Timber drums for insulated electric cables and bare conductors

3983 Metal drums for insulated electric cables and bare conductors

IEC
468 Method of measurement of resistivity of metallic materials

ASTM
D566 Test method for dropping point of lubricating grease

1.3 DEFINITIONS For the purpose of this Standard, the definitions given in AS 1057 and those below apply.

1.3.1 Wire—a filament of drawn metal having a constant circular cross section.

1.3.2 King wire—a central wire of a conductor having a nominal diameter larger than that of the surrounding wires.

1.3.3 Conductor—a finished circular stranded assembly consisting of three or more wires laid up together.

1.3.4 Diameter—the mean of two measurements at right angles taken at any one cross-section.

1.3.5 Direction of lay—the direction of lay is defined as right-hand or left-hand, as follows:

(a) Right-hand lay—when the slope of the wires is in the direction of the central part of the letter Z when the conductor is held vertically.

(b) Left-hand lay—when the slope of the wires is in the direction of the central part of the letter S when the conductor is held vertically.

1.3.6 Lay length—the axial length of one complete turn of the helix formed by an individual wire in a stranded conductor.

1.3.7 Lay ratio—the ratio of the lay length to the nominal external diameter of the corresponding layer of wires in the stranded conductor.

1.3.8 Breaking load of a wire—the maximum load obtained in a tensile test of that wire.

1.3.9 Ultimate tensile stress—the breaking load divided by the nominal cross-sectional area of the test wire.

NOTE: The nominal value has been used because of minor variation in diameter due to galvanizing.

1.3.10 Non-greased conductor—a conductor which is dry and free from grease, other than a residue of a manufacturing lubricant which may be on the wires.